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for the 1988 operating year.

By
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ABSTRACT

The analysis is based on data from 12 businesses in Northern Norway involved in shrimp production. The businesses represent around 75 % of the total production in the Counties of Troms and Finnmark. As was the case in the rest of the fishery industry, 1988 was a difficult year for shrimp producers. With an estimated total deficit of 35-40 million kro-

ner, 1988 was the fifth year in a row that the production of shrimp resulted in a deficit. Export prices fell by around 10 % during the year. However, raw material prices dropped more and work productivity increased, so that the contribution margin per kilo of raw material increased by 30 % compared to 1987. In 1988, investments were at a low level and constituted only 10-15 % of the figures for the 1984 operating year. In a regional comparison, plants in Troms show the best profitability, while the situation for the businesses in Finnmark has worsened severely during the last couple of years.

3 KEY WORDS

Economy

Shrimp processing industry

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FOREWORD

The shrimp processing industry in North Norway showed considerable growth during the first half of this decade. A rich supply of shrimp raw material and a decline in several other types of fisheries caused the shrimp processing industry to grow into an important part of our fishery industry. The last four years, shrimp catches have declined to a more "normal" level, which gradually led to a certain amount of rationalization in the industry as a result of considerable surplus capacity. Apart from reduced quantities, the industry has experienced a steady decline in market prices during the last three years.

Large variations in quantity, in raw material prices and in market prices have led to a need for continuous and up-dated information about profitability, production and cost conditions for this sector of our fishery industry. This present work was designed to meet this need for information.

This Cost/benefit Study in the shrimp processing industry is the tenth in a series of annual studies. The results of these studies are published in internal FTFI notes, work notes and reports. We also publish an abbreviated edition of this study in the form of an supplement to the magazine "Fiskeindustrin" ("The Fisheries Industry"). This report mainly deals with the results for the 1988 operating year, but we also discuss developments in the

industry since 1979. The last few years, we in the committee have only been dealing with those businesses that use machines for cleaning shrimps.

The studies were carried out by the Economic Section of the FTFI and commissioned by the National Association of the Fisheries Industry. During the last few years, the project has been financed through Efficiency Measures. Our thanks go to Jarle Løvland and Svein Ottar Olsen for all help given during the work, and for good advice and comments. We also wish to take this opportunity to thank all individuals outside of the FTFI, industries and organizations who have assisted us in this task. Most showed great interest and helpfulness in the gathering of data, and we hope that this report, together with the feedback to individual businesses, will be useful and helpful to the shrimp processing industry.

Tromsø, October 22, 1989.

Bjørn I. Bendiksen

SUMMARY

This Cost/benefit Study in the shrimp processing industry is number ten in a series of such studies, and its objective is to analyze profitability, production and cost conditions in the shrimp processing industry in North Norway.

We have concentrated this analysis on the 1988 operating year and to those businesses that employ machines for cleaning. Calculations for the year were carried out on the basis of data from 12 businesses using machine cleaning. Together, these plants represent close to 75 % of the shrimp production in the Counties of Troms and Finnmark. As the basis for our calculations, we used the annual financial reports of the businesses, production reports and interviews with the management of operations and finance.

The 1988 operating year must also be characterized as a difficult year in general for the shrimp processing industry. We estimated the actual deficit for the sector from shrimp production to be around 18 million Norwegian kroner (Nkr), at the same time as losses in other types of fish production further reduced financial results. Income from other activities and extraordinary income helped improve total profitability somewhat, but the total deficit is still estimated to be somewhere between 35 and 40 million Nkr.

This is the fifth year in a row that the shrimp processing industry is losing money in its main activities. Nominal results for 1988 remained unchanged since 1987, with an average deficit of 3 million Nkr. Annual results in percent of the production value (total fish production) for the twelve businesses that participated in this year's study deteriorated from -5.1 % in 1987 to -6.1 % in 1988.

Export prices for frozen, cooked and cleaned shrimps fell throughout the whole of 1988, from around 60 Nkr per kilo, including glazing, to be around 54 Nkr in December.

The yield from cleaning has shown continuous improvement throughout the 1980's, and is now at an average of 28.2 %, excluding glazing. Employee productivity has also shown very satisfying improvement, and increased by 2 % from 1987 to 1988. Total investments in the sector declined during the last few years, and in 1988 they were between 15 and 20 million Nkr. In comparison, investments in 1984 were no less than 128 million Nkr. The plants included in the study showed an increase of around 10 % in utilization of mechanical capacity compared to 1987. Based on one shift, utilization of capacity was 40 - 45 % in 1988.

For 1988, we estimated the total contribution margin in the shrimp processing industry in North Norway to be around 65

million Nkr, an increase of around 20 million Nkr compared to the preceding year. The contribution margin per kilo of raw material was 2.02 Nkr in 1988, an increase of 30 % compared to 1987.

Prime cost per kilo of unglazed shrimp was reduced by close to 13 Nkr from 76.34 Nkr in 1987 to 63.55 Nkr in 1988. Liquidity and solvency continue to be low in the industry. The share of owner's equity was 10.2 % of the total capital at the end of the year.

With the exception of 1981, the plants in Troms showed better profitability than the plants in Finnmark. In the last two years, the difference was relatively great. We estimated total losses in shrimp production in Finnmark to be around 25 million Nkr in 1988, while for the plants in Troms, we estimated a surplus of around 7 million Nkr. Lower sales prices, higher raw material prices, lower yields and higher capacity costs for the plants in Finnmark explain most of this difference.

CONTENTS

FOREWORD vi

SUMMARY viii

CONTENTS xi

1 INTRODUCTION 1
1.1 Methods and data gathering 1

2 PROFITABILITY CONDITIONS 4
2.1 1988 - Quite a difficult year for the shrimp processing industry 6
2.2 Less spread in results 8
2.3 Negative total return of close to two percent . . . 9

3 MARKET CONDITIONS 10

4 PRODUCTION COMPOSITION AND RAW MATERIAL CONDITIONS . . 15
4.1 Steady increase in cleaning yield 17
4.2 Price trends for raw material 19

5 PERSONNEL CONDITIONS 22

6 REAL CAPITAL CONDITIONS 24

7 COST CONDITIONS 27
7.1 Contribution margin calculations for 1988 27
7.2 Prime cost calculation for machine cleaned shrimp 29
7.3 Prospects for the 1989 operating year 32

8 FINANCIAL CONDITIONS 35

9 REGIONAL DIFFERENCES 37
9.1 Considerably lower profitability among finnmark businesses 37
9.2 Greater differences in sales price 39
9.3 Differences in raw material costs 40
9.4 Differences in contribution margin and prime cost 41

10 STRONG AND WEAK BUSINESSES 45

11 REFERENCES 49

1 INTRODUCTION

This work is organized according to the same pattern as the annual Cost/benefit Studies in the fishery industry. We consider both public and private institutions our target groups, and the demand for previous reports also shows that we find a number of readers within the fisheries industry, public administration and amongst financial institutions. The businesses that take part in the studies receive in return processed and analyzed data for each year for their own operations, data evaluated according to the branch norms that we present in this report.

1.1 METHODS AND DATA GATHERING

At the end of 1980, there were barely 40 active shrimp buyers in North Norway. Out of these, we selected all businesses that had annual purchases of raw material of more than 50 tonnes, and where shrimp constituted more than half of the total volume of business. The first years, we included a group of companies involved in manual cleaning of shrimp. The last four years, we have only included businesses that use machine cleaning. The reason for this is that this is the group that is responsible for almost 100 % of the production of shrimp in North Norway.

This year´s calculations are based on data from twelve of the sixteen businesses that operated with machine cleaning in 1988 in

North Norway. These plants together represent around 70 % of total shrimp production in this part of the country. The selection, which consisted of 23 companies in 1985, has since then been reduced. The reason for this is that several companies have been closed down. Companies that have gone bankrupt, or that had to terminate their activities for other reasons after July, 1988, are also included in our calculation basis, since they met the condition of having been in operation for most of the 1988 operating year.

In the tables presented in this report, we operate with two columns for 1987. The columns for 1987 where the number of businesses (N) = 12, represent profitability and production figures for the twelve businesses included in this year´s study. The columns where the number of businesses (N) = 19 represent the figures for the total selection in the Cost/benefit Study for 1987.

Data was gathered from company financial accounts, statements of operating income and expenditure, production reports, and from interviews with the company management and/or the manager of the financial functions. We utilized formalized questionnaires which we completed ourselves on the basis of data that was sent to us, or gathered in telephone interviews and visits to the companies. In this context we worked in close contact with the company

management and the economic and administrative management of the individual businesses.

Questionnaires were then transferred to ADP, where we carried out calculations of individual ratios. Each business also received in return an analysis of its own operations according to the same pattern that we used in the calculation of averages. The calculation rules that were used are described in Appendix 2. The reader will here also find definitions of most of the central concepts.

The studies were done by the Economic Section of the FTFI, and commissioned by the National Association of the Fisheries Industry. We will take this opportunity to thank all individuals, businesses and organizations who have provided assistance during the work with this study. During the last few years, the study was financed through Efficiency Measures.

2 PROFITABILITY CONDITIONS

In an appendix, the reader will find an itemized summary of average operating results, balance sheets and key figures for the sector. In the following sections, we will discuss the main features of these calculations. A more exact definition of the various concepts and calculation methods can be found in Appendix 2.

Our general profitability calculations were based on the following specifications:

Sales income from fish goods
± Change in fish inventory
= Production value
+ Raw material and packaging costs
= Processing value
+ Direct wages
= Contribution margin
+ Indirect costs (including interest and depreciation)
= Operating results (after interest)
± Results of other revenue/expenses
= **ANNUAL RESULTS**
+ Ordinary depreciation (book value)
+ Calculated depreciation
= **ADJUSTED RESULTS**

Annual results are identical to the concept of "results before balancing provisions" in the Stock Corporation Law for stock corporations and cooperative societies. In private companies, where the owner´s salary is not included in the accounts, we calculated a work remuneration for the company managers. Our concept of results includes the company´s total activities, including extraordinary revenue/expenses, which for individual businesses may be reflected in large contributions from the item "Results of other revenue and expenses".

We have also developed adjusted results, where we computed calculated depreciation instead of book depreciation. Here, machinery was depreciated over 8 years and fixed assets over 25 years. The reason for this calculation is primarily the large differences between the companies in their choice of depreciation principles for ordinary depreciation. The depreciation basis is the fire insurance value, which is an approximation of the replacement value. When we use calculated depreciation instead of book depreciation, "adjusted results" become somewhat lower throughout than "annual results". In our calculations (in this report), we use the concepts of "annual results" and "results" interchangeably, unless otherwise defined in the text.

2.1 1988 - QUITE A DIFFICULT YEAR FOR THE SHRIMP PROCESSING INDUSTRY

Profitability in the shrimp processing industry has varied greatly during the last few years. After a total surplus calculated at around 100 million Nkr in 1983, the shrimp processing industry has gone through difficult years. For 1984, we previously estimated sector losses from the production of fish and shell fish at 50 million Nkr. Losses in shrimp production in 1987 were estimated at close to 70 million Nkr, but have now been adjusted downward to be around 50 million Nkr. Based on a prime cost calculation for the production of machine cleaned shrimp, we calculated that the branch as a whole may have lost upwards of 18 million Nkr in 1988. When saying this, we should add that the results are not uniform, and that some companies ended 1988 with a surplus in their annual accounts.

In 1988, one third of the businesses showed a total surplus. In 1987, all the businesses had negative results before balancing provisions, while more than a fourth of the businesses had a surplus in 1986.

Although there were companies that showed a surplus in 1988, weighted results still dropped from -5.1 % of the production value in 1987 to -6.1 % in 1988. This can be explained by the fact that some companies had quite large losses in 1988. A con-

siderable portion of these losses occurred in the production of cod filets and salted cod, a production which was very difficult to operate at a profit.

If we disregard other activities and extraordinary income, two of the twelve businesses had profitable shrimp production in 1988, while in 1987 none of the businesses were close to the profitability margin of recovering total costs for shrimp production. Figure 1 shows a summary of profitability trends in the period from 1979 to 1988. The figure refers to the total selection of businesses for each individual year.

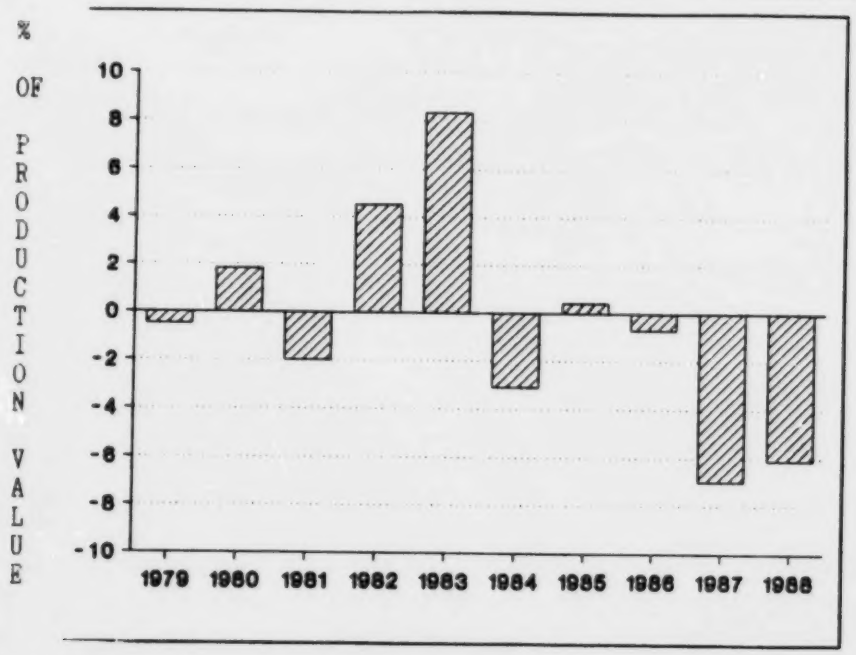

Figure 1 *Annual results in % of production value for the period from 1979 to 1988.*

2.2 LESS SPREAD IN RESULTS

As in most other sectors, we find large variations in profitability between the most profitable and the least profitable businesses. Table I shows the spread in profitability and how it has developed for the whole group of businesses. The large increase in the range of variation from 1986 to 1987 is caused by one extraordinary situation. If we disregard this, the variation in the rate of results was around 35 %, or the same as for the three preceding years. As we can see from Table I, the spread was reduced considerably from 1987 to 1988, and the variation in the rate of results in 1988 was down at around 21 %.

Table I *Spread in annual results in % of total production value.*[1]

Year	Lower quartile	Arithm. mean	Upper quartile	Variation range	Standard deviation
1979	-13,4	0,7	9,5	45,9	10,32
1980	-8,9	2,0	10,9	25,2	6,53
1981	-11,6	-1,8	4,4	22,7	6,34
1982	-0,3	5,4	16,7	31,1	7,53
1983	-0,8	6,8	14,1	21,1	5,56
1984	-15,1	-3,1	9,5	34,6	8,63
1985	-11,4	-0,9	6,7	35,8	7,44
1986	-11,8	-1,9	4,7	36,6	7,38
1987	-40,0	-14,9	-2,7	87,3	19,76
1988	-15,8	-6,2	2,9	21,8	7,07

[1] Transl. note: In all Figures and Tables "commas" = decimal points.

We also see that the three most profitable companies (upper quartile) showed a mean surplus of 2.9 % of the production value in 1988[2], after the companies in the upper quartile in 1987 had negative results for the first time since the studies began in 1979.

2.3 NEGATIVE TOTAL RETURN OF CLOSE TO TWO PERCENT

When calculating total return one calculates the result in relation to the capital that is tied up in the company. In order to arrive at the total amount that belongs to the capital, we add interest on debts to the result.

The average total return was negative for the second year in a row. From 1987 to 1988, total return dropped from -0.5 % to -1.8 % for the twelve plants. Compared to the whole group of businesses that took part in the Cost/benefit Study in 1987, total return increased by 0.5 percentage points. In comparison, the average total return in the Norwegian food industry is over 10 %. The highest rate of total return among the twelve businesses in 1988 was 10.4 %, while the lowest was -19.0 %. Half of the twelve plants had positive returns in 1988, which is one more than for the previous year.

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[2] Transl. note: Original has "1987", an obvious error.

3 MARKET CONDITIONS

The total export value of Norwegian shrimp declined from 998 million Nkr in 1987 to 904 million Nkr in 1988. The value of frozen, cooked and cleaned shrimp was reduced from 742 million Nkr to 505 million Nkr. Altogether 8,800 tonnes of frozen, cooked and cleaned shrimp were exported in 1988, compared to 11,400 tonnes the previous year. The export of frozen shrimp with shells was around 3,700 tonnes as in 1987, while the export value increased from 154 to 217 million Nkr. Most of the shrimp with shells go to Japan.

Great Britain, followed by Sweden and Denmark, have traditionally been our largest buyers of shrimp products. While Sweden in 1987 was our largest import country for frozen, cleaned and cooked shrimp measured according to quantity, Great Britain was our largest and most important market in 1988. Together, these two countries received more than 60 % of the Norwegian export of shrimp. In the 1980´s, the USA grew into one of our three largest market countries, and in 1987 it was our third most import market, with a share of more than 20 % of frozen, cleaned shrimp. Exports to the USA declined from 1987 to 1988 by 80 %. Too high a price level for Norwegian shrimp appears to be an important reason for this.

The price of shrimp varies according to its use, degree of processing, degree of glazing, markets, time of sale, etc. The crisis year of 1981 was followed by unfavourable price developments throughout 1982 and up to August, 1983, when they reached a temporary peak at over 52 Nkr per kg for our most important shrimp product: frozen, cooked and cleaned shrimp. Thereafter, prices dropped drastically and at the end of 1984 they were below 38 Nkr per kg. For long periods during 1985, prices were between 40 and 41 Nkr per kilo.

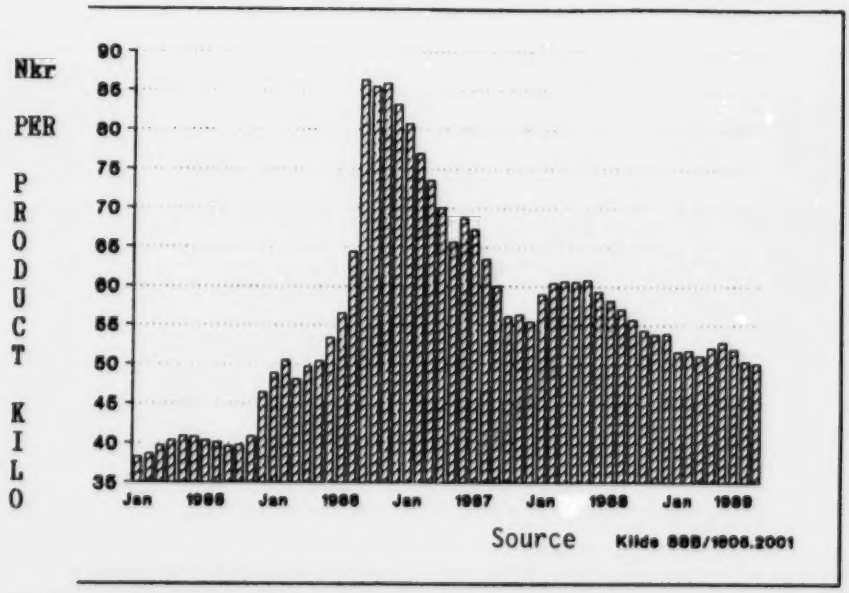

Figure 2 *Export prices for frozen, cooked and cleaned shrimp (fob Nkr per kilo of gross product).*

In the autumn of 1985, prices rose again, and the price increase continued up to September of 1986 when the average price per kg was no less than 86.33 Nkr. Individual shipments were sold that autumn for over 100 Nkr per kg. From January of 1987 to December

of the same year, prices dropped from 80.74 Nkr to 55.41 Nkr per kg. Prices rose somewhat at the beginning of 1988, but since May of 1988, prices have dropped almost continuously from month to month, and at the end of August, 1989, they were down to 49.96 Nkr per kg.

The figures in Figure 2 are from "Monthly statistics on foreign trade" from the Central Bureau of Statistics (CBS). If we compare our sales data to corresponding figures from the Export Statistics, we find a fairly good correlation. The reason why our data is a little different is that in our calculations we took into account sales income reductions, customer claims and discount prices. The degree of glazing and the relation between gross and net weight may also be reasons for differences between our figures and the figures from the Central Bureau of Statistics. Finally, we should point out that our data refers to businesses in North Norway, and that domestic sales have also been included in our material. Table II contains a comparison of our sales data to those of the CBS.

In Table II we have compared the prices with and without glazing. For the CBS statistics, we have used the same degree of glazing that we arrived at in our study. The table shows that the average price recorded by the CBS in 1988 was 57.27 Nkr per kg, including glazing. With corrections for glazing the sales price was 63.57 Nkr per kg on an annual basis. This was between 11 and 12 % lower

than in 1987. The average gross sales price for the businesses included in the study was in 1988 63.51 Nkr per kg, excluding glazing, which correlates very well with the figures from the CBS. For businesses included in our study, the net sales price, excluding glazing, varied between 51 and 64 Nkr per kg.

Table II *Net sales price for cleaned shrimp for 1987 and 1988 (fob Nkr per kilo of product)*

	Prices				Changes during period			
	Export statistics		Cost/benefit Study		Export statistics		Cost/benefit Study	
	1988	1987	1988	1987	Nkr	%	Nkr	%
Price incl. glazing	57,27	65,17	54,63	64,63	7,90	-12,1	10,0	-15,5
Price excl. glazing	63,57	71,69	60,63	71,10	8,12	-11,3	10,47	-14,7

While Norway was the market leader in cleaned cold water shrimp to the USA and Europe during the first half of the 1980´s, we have faced vigorous competition from Iceland and Greenland for this position. In 1988, Greenland´s shrimp catch was between 70,000 and 75,000 tonnes, while the Icelanders landed around 26,000 tonnes. High prices for cleaned cold water shrimp around 1986-87 resulted in new market shares in Europe for warm water shrimp. However, in Great Britain, which is our most important market for cleaned shrimp, imports of warm water shrimp have declined during 1989, at the same time as imports of cold water shrimp have increased. On the condition that prices are not too

high, it seems that the market prefers cold water shrimp to warm water shrimp.

On the North American West Coast, there has been a strong increase in the catch of cold water shrimp during the last few years, and in 1988, around 32,000 tonnes were landed. This means that a larger portion of the American market´s demand for cold water shrimp was covered by domestic production at very competitive prices. The price level of American shrimp meant that the Americans exported some of their catch to Europe, mainly to Great Britain. Active price competition from Greenland shrimp in the USA is another reason why the price of shrimp has fallen in recent years. We should also realize that prices rose too rapidly and were unrealistically high in 1986. This led to big losses for distributors and increased insecurity and mistrust on the market (Olsen, 1987).

Year end inventories of shrimp raw material at the twelve plants increased greatly the last year, and at the end of 1988 they were over 2,500 tonnes, compared to 1,100 tonnes at the beginning of the year. Inventories of fresh products at the plants included in the study also showed an increase, from 440 tonnes at the end of 1987, to 870 tonnes at the end of 1988. The twelve businesses included in 1988, had a total inventory of cleaned shrimp of almost 40 million Nkr at the end of the year, an increase of 15 million Nkr compared to the beginning of the year.

4 PRODUCTION COMPOSITION AND RAW MATERIAL CONDITIONS

Total landings of shrimp in Norway were around 40,000 tonnes in 1988. That is around 2,000 tonnes less than in 1987. As a comparison we can mention that around 91,000 tonnes were landed in the peak year of 1985. The initial value of the total Norwegian catch of shrimp was reduced to 660 million Nkr in 1988, compared to 735 million Nkr in 1987, and represented around 14 % of the total initial value of the fish and shellfish catch that year. In addition, in 1988, 6,600 tonnes of raw material were imported from the Soviet Union, Greenland and Iceland, which is 1,500 tonnes more than the previous year.

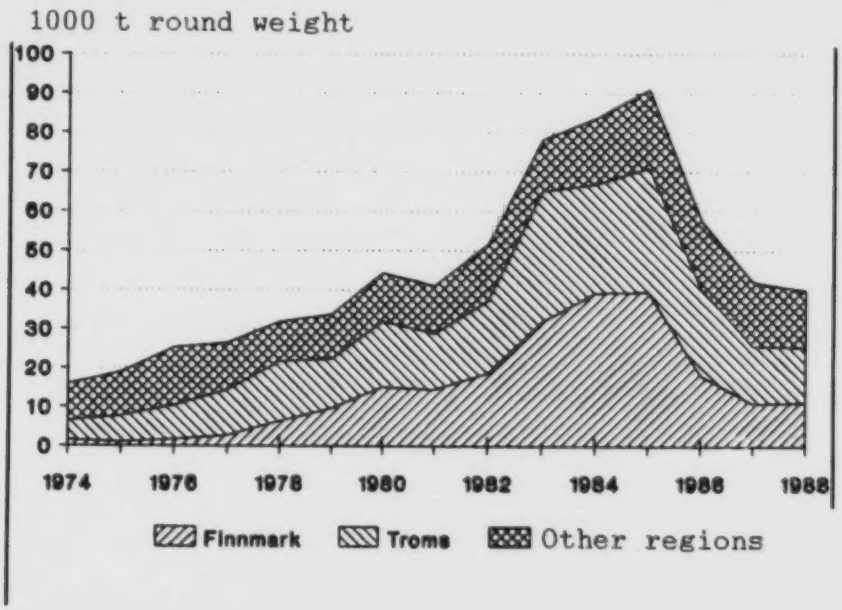

Figure 3 *Norwegian landings of shrimp in the period 1974 - 1988.*

In Figure 3 we have outlined shrimp fishing trends during the last few years. Following several years with an increase in quantity, the shrimp fishery experienced a drastic reduction in quantity in 1986 and 1987. We have to go back to 1979 to find smaller landings in North Norway.

Around 25,700 tonnes were landed in Finnmark and Troms, or around 600 tonnes less than the year before. The distribution was 11,200 tonnes for Finnmark, mainly East Finnmark, and 14,500 tonnes for Troms. The distribution between the two counties is about the same as in 1987. Imports of raw material to the two counties in 1988 were as follows: 2,000 tonnes for Finnmark and 4,600 tonnes for Troms. Even though there has been little change in total landings in Troms and Finnmark, we were able to record that the businesses' purchase of shrimp raw material increased by close to 30 % from 1987 to 1988. One of the reasons for this is to be found in the reconstruction that the shrimp processing industry in North Norway has been going through the last two years. In 1987, there were 21 businesses involved in machine cleaning in Troms and Finnmark, while this number had been reduced to 16 at the end of June, 1988.

In 1988, shrimp frozen on board constituted around 54 % of the total quantity used for cleaning, compared to around 64 % in 1987. The last two years there has been a clear reduction in the share of on board frozen shrimp, while the share in 1986 was as

high as 3/4 of the quantities that were used for cleaning that year.

4.1 STEADY INCREASE IN CLEANING YIELD

In 1988, we also recorded an improvement in the shrimp cleaning yield, which was reported to have been an average of 28.2 % last year. The corresponding figure for the previous year for the twelve plants was 27.9 % of the raw material weight. As shown in Table III, there has been a continuous and admirably fine increase in the cleaning yield for the years that our studies have been going on. Steadily improved production knowledge and new technology may explain much of this development.

That the increase in cleaning yield did not continue to rise as sharply from 1987 to 1988 as we witnessed previous years, may be blamed on the special conditions during the late summer and autumn of 1988, with a lot of small shrimp, particularly in landings of fresh raw shrimp. Most of the businesses then also gradually stopped their purchases of shrimp during this period of 1988, since processing of small shrimp was plainly unprofitable.

We have registered a stabilization in the variation in yield among the businesses during recent years, with a standard deviation of less than 1.3 %, i.e. 2/3 of the mass of businesses have a yield that is +/- 1.3 % from the average value (28.2 % in 1988).

The difference between the lowest and highest average yield in 1988 was 3.9 %, compared to 5.3 % the previous year.

Table III *Development and spread in mechanical cleaning yield for machine cleaned shrimp (excluding glazing).*

Year	Weighted average	Arithm. average	Variation range	Standard deviation	No. of observations
1979	23,2	23,6	4,4	1,32	N=13
1980	23,9	23,7	6,8	1,53	N=17
1981	24,2	24,2	8,2	1,90	N=17
1982	24,8	25,3	4,7	1,08	N=18
1983	25,5	25,8	4,0	1,16	N=20
1984	25,6	25,7	3,9	1,11	N=21
1985	26,3	26,2	4,1	1,18	N=22
1986	27,0	27,2	6,1	1,30	N=21
1987	28,1	28,1	5,3	1,33	N=19
	(27,9)	(27,8)	(2,7)	(0,88)	(N=12)
1988	28,2	28,0	3,9	1,26	N=12

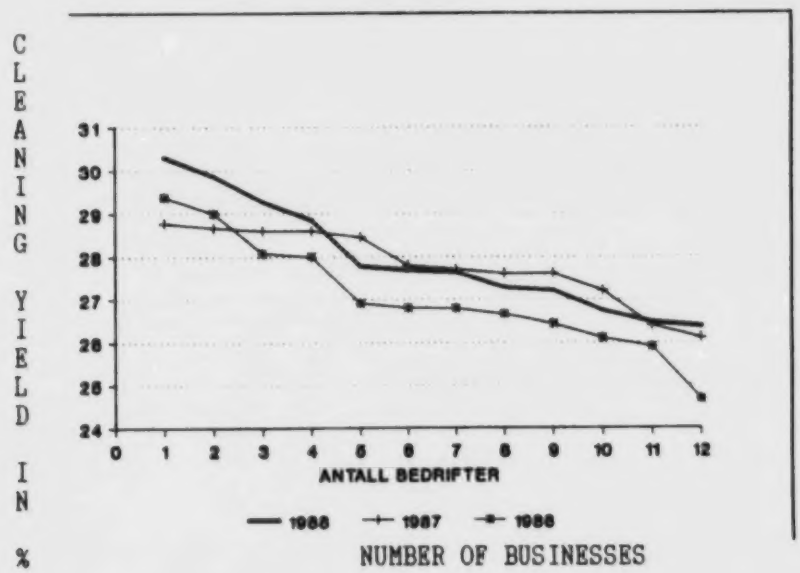

Figure 4 *Spread in mechanical shrimp cleaning yield (excluding glazing).*

Improvements in productivity mean reduced raw material costs for the businesses. The improvement in cleaning yield of 0.3 percentage points from 1987 to 1988 means that a business that received around 1,750 tonnes for cleaning, had a profit in raw material costs of close to 230,000 Nkr in 1988. An average cleaning yield like the one in 1986, which was at 27.0 %, would have meant that this business would have required a further 77 tonnes of raw material, at a value of 1 million Nkr, in order to produce the same amount of finished goods as it did with a net cleaning yield of 28.2 %.

Registering the exact degree of glazing has caused us some problems. This is not only because individual products are glazed and weighed differently in accordance with demand specifications in the individual import country or from customers. There are also several indications that the degree of glazing that is reported, does not always correspond to the actual situation. As far as possible, we attempted to make corrections for these different conditions. The degree of glazing for 1988 showed a weighted average of 9.9 % of the gross product weight.

4.2 PRICE TRENDS FOR RAW MATERIAL

Minimum prices and subsidy regulations for shrimp are determined by the Sales Board of the Norwegian Raw Fish Association. Here prices are grouped into 15-20 different price classes according

to size, use, canning, etc. The last few years, no price subsidies have been paid for shrimp for cleaning. Figure 5 shows price trends for shrimp for cleaning in the period from 1981 to 1988. We here compared prices for fresh and frozen raw shrimp (mixed) with the actual raw material costs the businesses paid in the same period.

The average prices in Figure 5 for frozen and fresh raw shrimp were taken from the Annual Report of the Norwegian Raw Fish Association. High market prices and strong competition for raw material had the result that the price paid per kilo was as high as 23 - 24 Nkr during some periods in 1986. In 1987 as well, prices paid to fishermen were periodically above the minimum price. From 1987 to 1988, average prices for mixed raw shrimp (both frozen and fresh raw material) fell by around 20 %, from approximately 15.20 Nkr to around 12.20 Nkr per kg.

However, actual raw material costs vary somewhat from these figures. Firstly, we should point out that the average prices in our study also include imported raw material and raw material from packers. They also include freight, boxes, ice and any other costs related to the purchase of raw material, so that actual raw material costs in 1988 were around 0.30 Nkr higher than the above mentioned average prices.

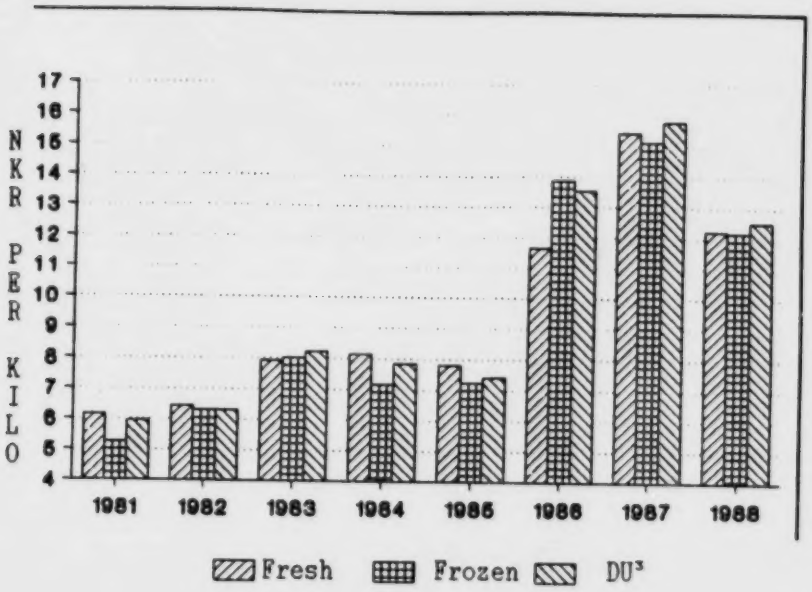

Figure 5 *Price trends for raw shrimp for cleaning (mixed per kg, figures in current Norwegian kroner).*

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³ Transl. note: DU probably refers to this study (Driftsundersøkelse)

5 PERSONNEL CONDITIONS

In the 1980´s, the shrimp processing industry provided a welcome contribution to the employment of women in the on-shore plants in North Norway. Based on a production quantity of 80,000 tonnes of shrimp raw material, we estimated that there were 1,500 persons employed in the industry in 1985. The decline in the supply of raw material had the result that in 1988, there were between 600 and 700 employed during parts, or the whole of the year in the industry. We estimated total expenses, in the form of wages and social costs for the processing of shrimp, to close to 80 million Nkr in 1988, i.e. around the same amount as in 1987.

Work productivity increased by between 4 and 10 percent annually from 1981 up to 1986. In this respect, developments have been very satisfactory. As a measurement of work productivity we used direct wage costs per kilo of net product. With corrections for an average wage increase of 4 % from 1987 to 1988, this ratio gives an increase in productivity of around 2 % from the previous year, which is the same productivity growth registered from 1986 to 1987. The fact that we recorded somewhat lower productivity growth in 1987 and 1988 compared to the period from 1981 to 1986, can probably be explained by the reduction in the supply of raw material, with resultant lower utilization of capacity and the special problems with small shrimp in the late summer and autumn of 1988.

The nominal hourly wage in the fishery industry increased from 63.60 Nkr per hour in 1987, to 65.65 per hour in 1988 (mean of hourly wage and piece work) for men, which is an increase of 3.2 %. Correspondingly, the nominal hourly wage for women in the fishery industry increased from 60.10 Nkr per hour to 63.20 Nkr per hour, an increase of 5.1 %. The average in the food, drink and tobacco industry in 1988 was 75.24 Nkr per hour for men, and 66.74 Nkr per hour for women. (Wage and absenteeism statistics, NHO - Norwegian Trade Organization, 1988).

6 REAL CAPITAL CONDITIONS

Capacity in the shrimp processing industry declined considerably during the last two years. During 1988, there were around 100 shrimp cleaning machines in operation in North Norway, while at the end of 1985 there were around 155 cleaning machines in operation. The quantity of raw material produced per machine was 291 tonnes in 1988, compared to around 260 tonnes the previous year. As a comparison, we can mention that the quantity produced per machine was over 580 tonnes in 1985. A quantity of 291 tonnes per machine would, with one work shift, 230 operating days and a machine capacity of 400 kg per hour, correspond to a utilization of mechanical capacity of 42 %.

One situation which complicates these calculations is that landings of shrimp to a large extent are concentrated to the summer months. In 1988, close to 75 % of the total quantity was landed in the months from May to September, inclusive. With the same prerequisites as above, this gives us a utilization of mechanical capacity of around 66 % for these months.

In spite of the low utilization of machine capacity, utilization of real capital continues to be higher in the shrimp processing industry than in other North Norwegian fishery industries. One of the ratios that we have used to identify the utilization of real capital was to look at the production value in relation to the

insurance value. We assume that the latter gives an indication of the replacement value of the plants. From 1987 to 1988, this percentage dropped from 114 % to 90 %. For North Norwegian freezing plants, the production value in percent of total capital (replacement value) was between 90 and 93 % from 1985 to 1987, but dropped to 77 % in 1988. (Dreyer and Løvland, 1987, Bendiksen and Dreyer, 1988, 1989.)

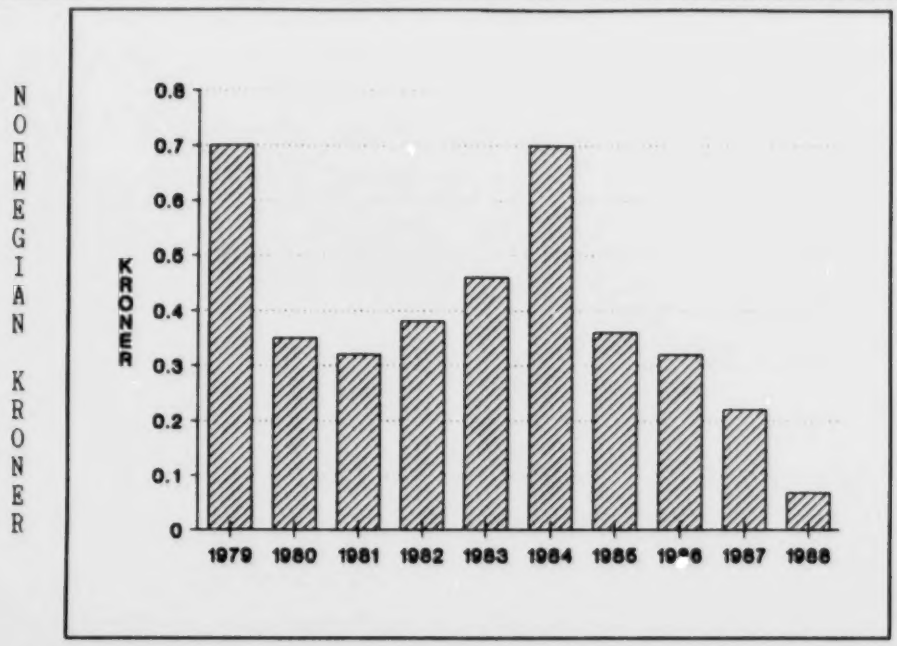

Figure 6 *Investments per total wage Nkr in the period 1979-1988.*

We estimated total investments in the sector to between 15 and 20 million Nkr in 1988, compared to around 50 million Nkr in 1987. The twelve plants that participated in the Cost/benefit Study together invested 7.5 million Nkr in 1988. This constitutes 1.2 % of the total business volume of the plants, which is one third of the investment level of 1987. Surplus capacity, large losses and

the general economic situation have led to a drastic decline in investment activities during the last few years. At the same time, the shrimp processing industry is to a large extent a new and modern industry, so that there has not as yet been any need for major investments in maintenance. Figure 6 above shows investment activity developments in relation to employment during the period from 1979 to 1988.

7 COST CONDITIONS

The fishery industry is raw material intensive compared to other Norwegian industries. Raw material costs usually constitute between 60 and 65 % of the production value. In 1986 and 1987, the share of raw material costs of total costs increased considerably, and in 1987 it constituted more than 80 % of the production value of cleaned shrimp. In 1988, this figure was reduced to 75 %. After raw material, wages and social costs constitute the largest cost components in the industry.

7.1 CONTRIBUTION MARGIN CALCULATIONS FOR 1988

For 1988 we estimated the total contribution margin in the shrimp processing industry for the production of shrimp to be around 65 million Nkr. This is around 20 million Nkr more than in 1987, but well below the peak year of 1983, when this sector had a total contribution margin, converted to current value of the Norwegian krone, of around 380 million Nkr.

Table IV contains contribution margin calculations for mixed shrimp for cleaning for the 1987 and 1988 operating years. The table is based on data from the twelve businesses included in the Cost/benefit Study for 1988, data from the same twelve businesses in 1987 and data from all of the 19 businesses that participated in the Cost/benefit Study in 1987. These account figures were

adjusted for possible hidden reserves in inventories of finished goods and raw material.

Table IV *Contribution margin calculations for 1987 and 1988.*

Group average Number of businesses (N)		N=12 1988		N=12 1987		N=19 1987	
		1000 Nkr	%	1000 Nkr	%	1000 Nkr	%
1.	Sales income	29235	100,0	32509	100,0	28189	100,0
1.1	Sales income reductions	1319	4,5	1030	3,2	894	3,2
1.2	Changes in inventory	1423	4,9	-1116	-3,4	-1322	-4,7
2.	PRODUCTION VALUE (fob)	29339	100,0	30363	100,0	25953	100,0
3.	DIRECT VARIABLE COSTS	25814	88,0	27938	92,0	24076	92,8
3.1	Raw material - subsidies, ice	21884	74,5	24409	80,4	21086	81,2
3.2	Prod. wages, incl. social costs	3403	11,6	2939	9,7	2520	9,7
3.3	Packaging & add. supplies	547	1,9	590	1,9	491	1,9
4.	CONTRIBUTION MARGIN I	3524	12,0	2425	8,0	1877	7,2
5.	RATIOS						
5.1	CM/Raw material kg, Nkr/kg	2,02		1,56		1,40	
5.2	CM/Product kg, Nkr/kg	6,45		5,10		4,54	
5.3	CM/Prod. kg, excl. glazing, Nkr/kg	7,16		5,59		4,99	
6.	CALCULATED DATA BASED ON						
6.1	Number of machines	72		72		97	
6.2	Sales weight incl. glazing (t)	511		482		422	
6.3	Raw material for cleaning (t)	1747		1556		1335	
6.4	Product weight incl. glazing (t)	546		475		413	
6.5	Cleaning yield incl. glazing	31,26		30,54		30,94	
6.6	Degree of glazing	9,9		8,7		9,1	
6.7	Inventory value of finished goods Dec. 12, Nkr/kg	45,2		55,4		55,1	

The contribution ratio (contribution margin in percent of production value) increased for the twelve businesses from 8 % in 1987 to 12 % in 1988. This was attributed to the share of raw material costs of the production value, which was reduced from 80.4 % to 74.5 % from 1987 to 1988 as a result of lower minimum prices for

raw shrimp. That the share of wage costs of the production value of shrimp increased by close to 2 percentage points, was attributed mainly to the fact that the production value was reduced as a result of lower export prices. The contribution margin per kilo of raw material increased by around 30 % to 2.02 Nkr per kg in 1988, compared to 1.56 Nkr in 1987. Correspondingly, the contribution margin per product kilo (excl. glazing) increased from 5.59 Nkr to 7.16 per kg during the same period.

7.2 PRIME COST CALCULATION FOR MACHINE CLEANED SHRIMP

Based on the contribution margin and results accounts, we developed a prime cost calculation for the production of machine cleaned shrimp. The calculation is based on product weight, excluding glazing, and is reproduced in Table V. When calculating indirect costs, we used as basis businesses where shrimp production constitutes more than 90 % of the total production value, and then divided the indirect costs according to the relative share of shrimp production of the total production value. The reason we used this method to distribute indirect costs was the large differences in the results of the distribution, due to the choice of distribution factors. By using the chosen method, we reduced the size of error distributions, where e.g. indirect costs from other fish production is attributed to shrimp production. The disadvantage is that the selection for the calculation of indirect

costs becomes smaller, and that we may have larger errors due to a biased selection.

Table V *Prime cost calculation for production of machine cleaned shrimp (Nkr per product kilo, excl. glazing).*

Group average Number of businesses (N)	N=12 1988		N=12 1987		N=19 1987	
	Nkr	%	Nkr	%	Nkr	%
Raw material - subsidies, ice	44,43	69,9	56,26	73,7	56,09	72,7
Prod. wages incl. social costs	6,92	10,9	6,77	8,9	6,71	8,7
Packaging & add. supplies	1,11	1,7	1,38	1,8	1,30	1,7
Direct variable costs	52,46	82,5	64,39	84,3	64,10	83,0
Indirect costs	11,09	17,5	11,95	15,7	13,09	17,0
Total costs per kg	63,55	100,0	76,34	100,0	77,19	100,0
Net sales price	60,67		71,59		71,10	
Sales price - prime cost	-2,88		-4,75		-6,09	

As we see from the table, costs for raw material were reduced by 11.83 Nkr, or around 11 %, to 44.43 Nkr per product kilo in 1988. This was primarily a result of lower minimum prices for raw shrimp for cleaning. The increase in cleaning yield of close to 0.3 percentage points from 1987 to 1988 helped reduce the cost of raw material by 0.45 Nkr per product kilo.

Nominal direct wage costs increased from 6.71 Nkr to 6.92 Nkr, and with corrections for wage growth they indicate, as previously mentioned, a growth in productivity of around 2 % from 1987 to 1988.

According to data from the twelve plants, indirect costs[4] were reduced from 11.95 Nkr to 11.09 Nkr per product kilo during the same period. Of the indirect costs, capital expenses as shown in balance sheets, constituted 3.96 Nkr per product kilo, compared to 4.03 Nkr the previous year. As the table shows, the entire 1987 selection of 19 businesses had somewhat higher capital expenses per product kilo than the twelve businesses that participated in 1988 as well. One explanation could be that some of the businesses that dropped out from the selection from 1987 to 1988, had generally high indirect costs, at the same time as their utilization of capacity was very low and therefore their indirect costs per product kilo were also higher than average. Table V also shows that the prime cost per kilo of cleaned shrimp in 1988 was 63.55 Nkr, or 13.09 Nkr (16.8 %) lower than the previous year.

As we can see, in our calculation the prime cost per product kilo was reduced by close to 13 Nkr (16.8 %) to 60.67 Nkr from 1987 to 1988. This still gives a negative contribution in relation to the average net sales prices achieved by the businesses in 1988. The negative contribution was calculated to be 2.88 Nkr per product kilo, which is still a considerable improvement in relation to 1987.

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[4] Indirect costs are distributed according to the percentage of the fish production that includes shrimp. The calculation basis was gathered from businesses where this percentage was greater than 90 %.

Based on the average net sales prices that the businesses achieved in 1988, the shrimp processing industry lost an average of 2.88 Nkr (4.7 % of the sales value) per product kilo (all figures excluding glazing). However, as we will see later on, there are big regional differences both in contribution margin and financial results per kilo of cleaned shrimp.

Based on the prerequisites above, we calculated that the shrimp processing sector as a whole, may have lost close to 25 million Nkr in 1988. Losses in shrimp production in 1987 were estimated at close to 70 million Nkr, but have now been adjusted downward to around 50 million Nkr. The reason for this is that we this year have made some changes in the calculation basis for the distribution of indirect costs compared to previous years, so that these costs in the new calculations for 1987 have been reduced by around 11 %.

7.3 PROSPECTS FOR THE 1989 OPERATING YEAR

From January 1 until September 1 this year, 13,400 tonnes of shrimp were landed in Finnmark, which is an increase of 33 % compared to the same period in 1988. In Troms as of September 1, 16,900 tonnes were landed, and this is an increase of 94 % compared to the corresponding period last year. As of the month of May this year, the Norwegian Raw Fish Association began using a

new minimum price system for shrimp. Average prices to fishermen for raw shrimp intended for cleaning were 9.99 Nkr per kg during the period from January 1 to September 1, which was a reduction of 2.24 Nkr (18 %) compared to the average prices in 1988. At the same time, average export prices for frozen, cooked and cleaned shrimp were reduced from 57.27 Nkr per kg in 1988 to 51.33 Nkr for the first eight months of this year.

Based on these figures, and with the prerequisites of the same degree of glazing as we recorded in 1988, of the same yield percentage, of an average wage increase of 4 % from 1988 to this year, and of a productivity growth in the work force of 2 % as for the last two years, we set up a contribution margin calculation for the first eight months of 1989. As we see in Table VI, our prerequisites result in a contribution margin of 9.69 Nkr per product kilo, excluding glazing. This is 2.54 Nkr more per kg than the average figures for 1988, or an increase of around 35 %.

Table VI *Contribution margin calculation for 1989 (Nkr per product kilo, excluding glazing).*

Sales price	56,98
Sales income reductions (4.5 %)	2,58
Net sales price	54,42
Direct variable costs	44,73
Raw material	36,49
Prod. wages incl. social costs	7,04
Packaging	1,20
Contribution margin I	9,69

The large increase in landings of shrimp so far this year should result in a considerable increase in the utilization of capacity, both purely mechanical capacity and in relation to real capital, and it would be reasonable to expect a noticeable reduction in indirect costs per product kilo compared to 1988. The above mentioned conditions should together produce a considerable improvement in the profitability of the sector for the current year compared to 1988.

8 FINANCIAL CONDITIONS

Sound financing requires that the working capital (defined as the difference between current assets and short term liabilities) should constitute around half of the value of the inventory. The average inventory at the end of 1988 was around 23 % of total assets, which would indicate a working capital of 11.5 %, which is considerably more than the 3.4 % the businesses had at the end of 1988. Figure 7 gives a summary of working capital and owner´s equity trends during the period from 1979 to 1988. The figures apply to the complete selection of businesses for respective years.

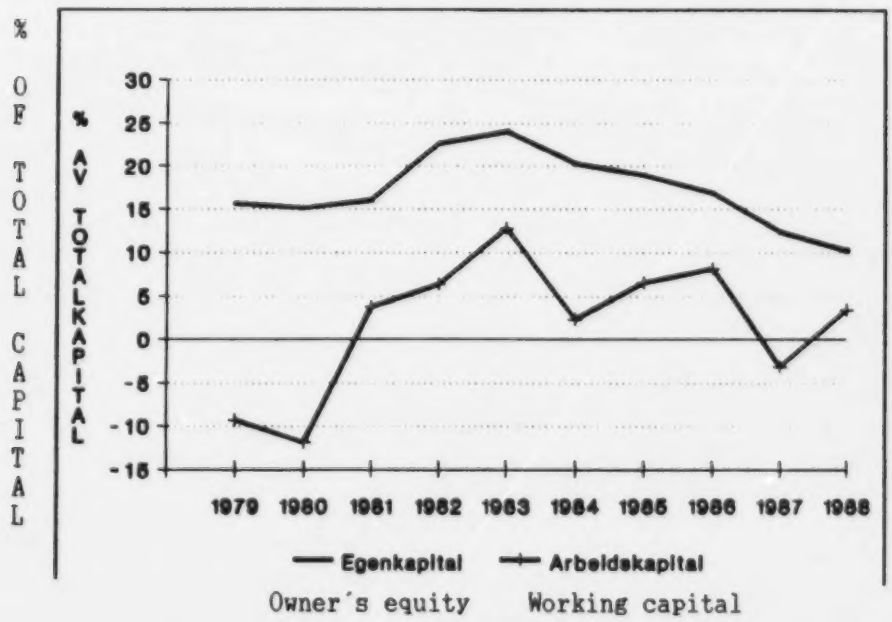

Figure 7 *Working capital and owner´s equity in percent of total capital for the period 1979 - 1988.*

Solvency expresses a business´ capacity to carry losses without any ill effects on its creditors. The percentage of owner´s equity is often used as a measurement of a business´ solvency, and in our calculations we defined this relation as the sum of owner´s equity and conditional provisions for taxes in percent of total assets at year end. As we see in the Figure, the average percentage of owner´s equity has declined each year since 1983, and at the end of 1988 it was as low as 10.2 %.

Another important financial factor these days is liquidity, which expresses a business´ capacity to meet its short term obligations. Liquidity ratio 1 expresses the relation between current assets and short term debts, which should be 2:1 in order that a business may be said to possess good liquidity. At the end of 1988, this relation was 1.06:1, i.e. current assets exactly covered short term liabilities. Liquidity ratio 2 expresses the relation between most liquid current assets (i.e. excluding inventory) and short term liabilities, which should have a relation of 1:1. Liquidity ratio 2 of the businesses dropped from 0.68 (0.68:1) at the beginning of 1988 to 0.63 at the end of the year and is considerably below recommended norms.

9 REGIONAL DIFFERENCES

In this chapter we will look at differences in income and cost conditions for plants in the counties of Troms and Finnmark. Earlier on in this study, we estimated total losses in the sector to be close to 18 million Nkr for the production of shrimp in 1988. Below we will show how the businesses in Finnmark lost around 25 million Nkr in their shrimp production in 1988, while we estimated a surplus of around 7 million Nkr for the plants in Troms.

9.1 CONSIDERABLY LOWER PROFITABILITY AMONG FINNMARK BUSINESSES

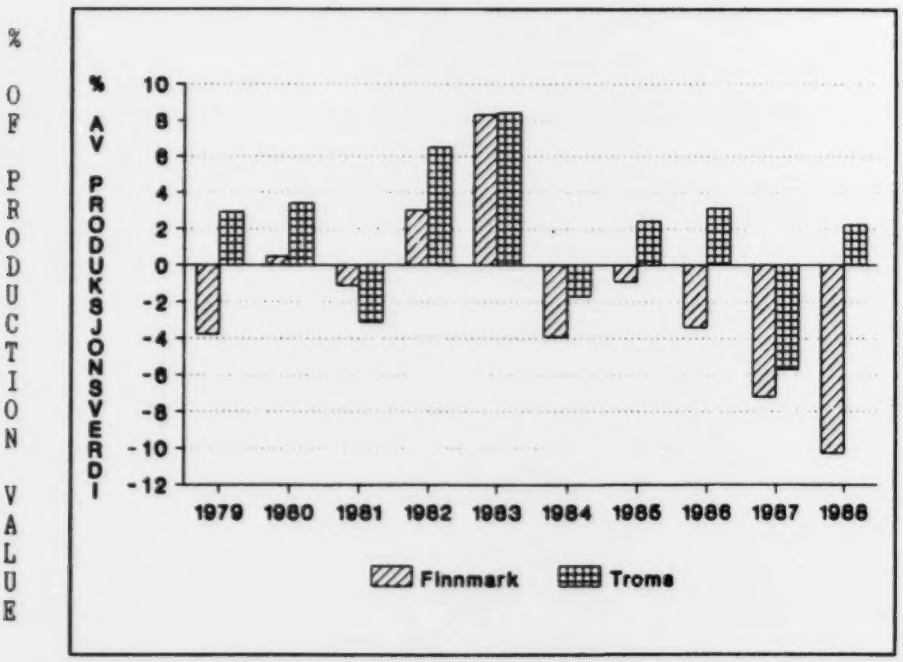

Figure 8 *Regionally distributed annual results in percent of production value for the period 1979 - 1988.*

With the exception of 1981, the plants in Troms showed better profitability than the plants in Finnmark. As was the case for the previous four years, the difference was great in 1988 as well. The plants in Troms, which are characterized by having a shrimp production that constitutes a considerably larger portion of their total production value than is the case for the plants in Finnmark, had an average result of 2.2 % of the production value in 1988, compared to -5.7 % in 1987. Corresponding figures for the industry in Finnmark were -10.3 % in 1988 compared to -7.2 % in 1987.

As in previous years, higher costs for raw material in the production of shrimp, considerably lower yields, lower utilization of capacity, as well as losses from the production of other fish in the plants in Finnmark may explain this difference. These figures, which are based on the total activities of the plants, are reproduced in Figure 8.

Total returns show the same trends as the rate of surplus. Last year, this rate was +6.5 % for the plants in Finnmark, compared to +8.4 % in Troms.

9.2 GREATER DIFFERENCES IN SALES PRICE

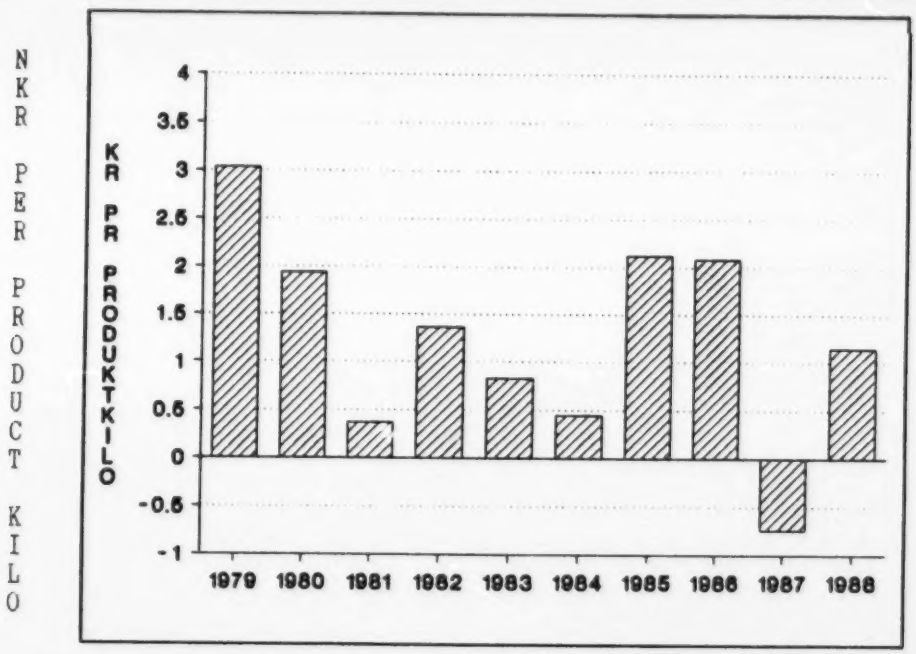

Figure 9 *Difference in net sales price in favour of the businesses in the County of Troms during the period 1979 - 1988 (excl. glazing, figures in current Norwegian kroner).*

A general characteristic is that the plants in Troms have achieved higher sales prices than similar plants in Finnmark. From 1984 to 1985, this difference increased from 0.48 Nkr to 2.12 Nkr per product kilo (excl. glazing). In 1986, the plants in Troms obtained a net sales price (excl. glazing) of 69.32 Nkr per kg. The plants in Finnmark were more than 2 Nkr lower, with an average price of 67.24 Nkr per product kilo. In 1987, however, it was the plants in Finnmark that achieved the highest prices, with an average of 71.50 Nkr per net product kilo, while the plants in Troms achieved a price per kilo of 70.76 Nkr. In 1988, Troms was

again at the top with a net price per kilo of 61.26 Nkr, while the businesses in Finnmark had a net kilo price of 60.11 Nkr.

In Figure 9 we have outlined the trends in the difference in net sales prices per product kilo between the businesses in Troms and Finnmark. The figure shows the difference in favour of the businesses in Troms.

9.3 DIFFERENCES IN RAW MATERIAL COSTS

In 1984 and 1986, it was the price of raw material that could explain much of the difference in profitability between the businesses in Troms and Finnmark. In 1987 as well, higher prices for raw material were paid in Finnmark, but the difference was then 0.38 Nkr, or 2.4 %, for mixed shrimp for cleaning. In 1988, this difference increased to 0.63 Nkr per kg in favour of the businesses in Troms.

The businesses in Finnmark had raw material costs of 46.79 Nkr per product kilo in 1988, while the costs for the businesses in Troms were 41.47 Nkr per kg. Close to 60 % of this difference can be attributed to lower cleaning yield in the plants in Finnmark, while the remaining 40 % of the difference can be attributed to higher prices for raw material. While the cleaning yield increased greatly among the businesses in Troms from 1987 to 1988, the businesses in Finnmark experienced a reduction in yield. In 1988,

the businesses in Troms had an average net cleaning yield of 29.4 %, an increase of 1.1 percentage points from 1987, while the businesses in Finnmark had a cleaning yield of 27.3 %, which was a reduction of 0.3 percentage points.

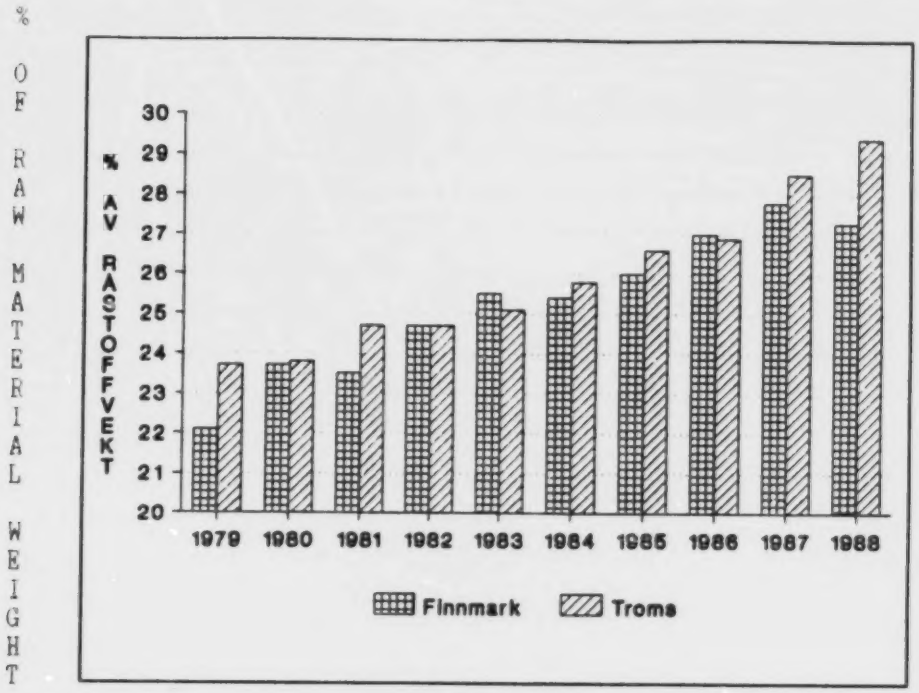

Figure 10 *Regionally distributed mechanical cleaning yield for the period 1979 - 1988 (excl. glazing).*

9.4 DIFFERENCES IN CONTRIBUTION MARGIN AND PRIME COST

With the exception of 1983, the businesses in Troms had higher contribution margins than the industry in Finnmark. In 1988, the businesses in Troms had a contribution margin per product kilo (excl. glazing) of 10.65 Nkr, while the industry in Finnmark

achieved an average contribution margin of 4.34 Nkr. This means that while the businesses in Troms increased their contribution margin per product kilo by more than 50 % from 1987 to 1988, the businesses in Finnmark experienced a reduction in their contribution margin of 7 % during the same period. Contribution margin trends are outlined in Figure 11. The figures apply to the *entire* selection of businesses for respective year.

As to the difference between Troms and Finnmark in contribution margin per kg of finished goods, around 23 % can be attributed to lower account prices and around 34 % to higher raw material prices for the businesses in Finnmark. Lower cleaning yield explains 50 % of the difference, while the businesses in Finnmark recovered around 7 % of this difference through lower costs for packaging and additional supplies.

The above-mentioned income and cost conditions are summarized in Table VII, where we have set up a prime cost calculation for the industry in these two counties. We have also calculated indirect costs on a per county basis, according to the same calculation rules used in Table V. Indirect costs per kg were on this basis 12.29 Nkr for Finnmark, compared to 10.24 Nkr for the plants in Troms. In Finnmark, capital costs (interest costs + ordinary depreciation) constituted around 40 % of indirect costs, while the corresponding figure for Troms was 31 %. Lower utilization of

capacity explains why capital costs in Finnmark are relatively higher than in Troms.

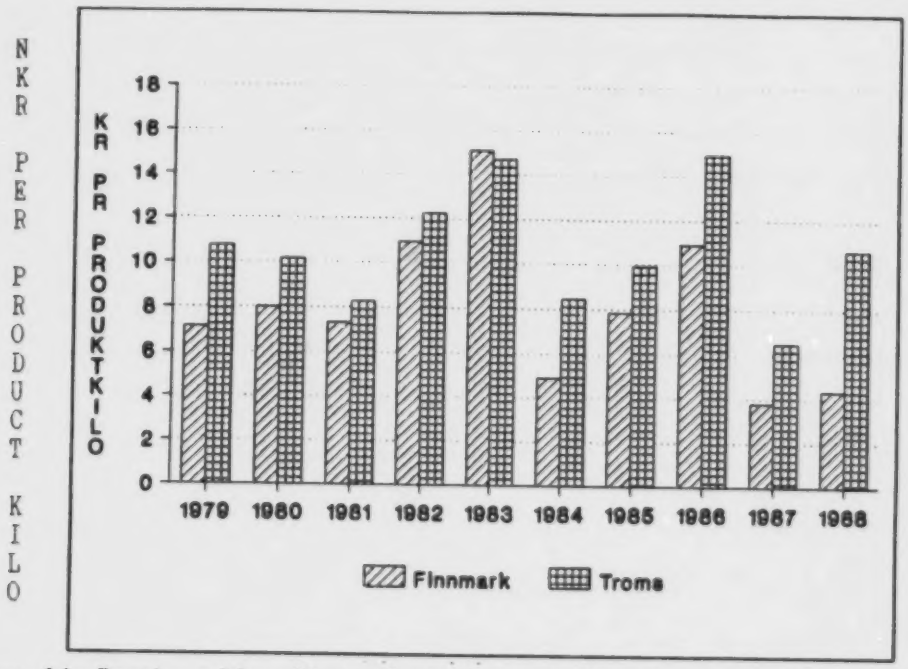

Figure 11 *Regionally distributed contribution margin per product kilo for the period 1979 - 1988 (current Norwegian kroner per kg, excl. glazing).*

The difference in total costs between the businesses in Troms and Finnmark was around 7.00 Nkr in favour of Troms in 1988. If we take into consideration the difference in sales price, we find that the plants in Finnmark lost 6.81 Nkr (+10.2 % of the production value) per product kilo. The businesses in Troms, however, had a surplus of 1.28 Nkr (2.1 %) per product kilo. Based on total landed and imported shrimp raw material that was used for cleaning in the two counties in 1988, we estimated the total surplus from shrimp production for the industry in Troms to be

around 7 million Nkr in 1988, while the industry in Finnmark lost around 25 million Nkr.

Table VII *Regionally distributed prime cost calculation for production of machine cleaned shrimp - 1988 (Nkr per product kilo, excl. glazing).*

	Finnmark N=8		Troms N=4	
	Nkr	%	Nkr	%
Raw material - subsidies, ice	46,79	69,9	41,47	69,1
Prod. wages incl. social costs	6,92	10,3	6,91	11,5
Packaging & add. supplies	0,92	1,4	1,36	2,3
Direct variable costs	54,63	81,6	49,74	82,9
Indirect costs	12,29	18,4	10,24	17,1
Total costs per kg	66,92	100,0	59,98	100,0
Net sales value per kg	60,11	89,8	61,26	102,1
Results per kg	-6,81	-10,2	1,28	2,1

10 STRONG AND WEAK BUSINESSES

In our work we are often asked what factors characterize strong and weak businesses. Behind the economic differences we often find a number of explanatory factors, which vary not only from business to business, but also from period to period. Studies by Olsen and Øberg (1980) and Dreyer (1985) also confirm this.

Table VIII *Difference in contribution margin between financially strong and weak businesses in 1988 (Nkr per product kilo, excl. glazing).*

		Lower quartile		Weighted average		Upper quartile	
		Nkr	%	Nkr	%	Nkr	%
1.	SALES INCOME	57,26	100,0	63,51	100,0	63,99	100,0
1.1	Sales income reductions	2,37	4,1	2,87	4,5	2,23	3,5
2.	NET SALES PRICE	54,89	95,9	60,64	95,5	61,76	96,5
3.	PRODUCTION VALUE (fob)	54,71	100,0	59,58	100,0	60,89	100,0
4.	DIRECT VARIABLE COSTS	53,98	98,7	52,43	88,0	49,62	81,5
4.1	Raw material - subsidies, ice	46,97	85,9	44,41	74,5	41,60	68,3
4.2	Prod. wages, incl. social costs	6,01	11,0	6,91	11,6	6,69	11,0
4.3	Packaging & add. supplies	1,00	1,8	1,11	1,9	1,33	2,2
5.	CONTRIBUTION MARGIN I	0,73	1,3	7,15	12,0	11,27	18,5
6.	RATIOS						
6.1	CM/Raw material kg, Nkr/kg	0,19		2,01		3,29	
6.2	Net cleaning yield	26,5		28,2		29,2	
6.3	Degree of glazing	10,2		9,9		10,7	
6.4	Inventory value of finished goods Dec 31, Nkr/kg	41,33		45,19		44,24	

A simple method of comparing this difference is to look at upper and lower quartiles (25 %) of the mass of businesses - and to place these groups opposite each other. As an evaluation criterion, we used the contribution margin per kilo of raw material.

Table VIII contains a contribution margin calculation for machine cleaned shrimp in 1988. Here we have compared the weighted average of the three businesses with the highest contribution (upper quartile) to a similar number of businesses with the lowest contribution (lower quartile).

Between the upper and lower quartile, there was a difference of 10.50 Nkr in contribution margin per kilo of product (excl. glazing). That is to say that the businesses in the lower quartile barely produced with a contribution margin in 1988. In Table IX, we set the difference in contribution margin at 100 % and saw which are the cost and income components that could explain the difference between these two groups of companies.

Table IX *Difference between upper and lower quartile.*

	1988		1987	
	Nkr	%	Nkr	%
Sales prices				
Cleaning yield	6,20	59,0	6,20	44,0
Raw material prices	4,20	40,0	2,50	18,0
Other	1,10	10,5	4,00	28,5
	(1,00)	(9,5)	1,30	9,5
Difference	10,50	100,0	14,00	100,0

In 1988, close to 60 % of the difference could be explained by the fact that the businesses in the lower quartile obtained lower account prices per kg of finished goods, while the remaining 40 % could be explained by a lower cleaning yield. Higher raw material costs constituted around 10 % of the difference, at the same time as the businesses in the lower quartile managed to recover

around 10 % in lower costs for production wages and packaging and additional supplies.

Whether it was the income or cost side that best explained the fluctuations in contribution margins varied from year to year. For 1983, the cleaning yield explained more than half of the difference. In the years 1984 and 1985, sales prices explained more than 50 % of the difference between strong and weak businesses. It is worth noting, that those two years were characterized by a good supply of raw material and strong price competition on the markets (low market prices).

In 1986 we see the results of the downturn in landed quantities of raw material and of high market prices. This was actually the first time since these studies begun, that the lower quartile, on average, achieved somewhat higher market prices than the upper quartile. That year it was the price of raw material that explained the entire difference. High market prices, combined with scarcity of raw material resulted in individual businesses paying considerable excess prices in 1986, which also reduced their relative contribution margin considerably. In 1987 as well, the businesses in the lower quartile paid more for raw material, with the result that raw material prices alone explained close to 29 % of the difference in contribution margin. This, together with a lower yield for the lower quartile, had the result that the costs of raw material explained 46 % of the difference (6.50 Nkr) in

contribution between financially strong and weak businesses. We should also note that in 1987, market prices continued to be an important explanatory factor.

11 REFERENCES

Bendiksen, B., Dreyer, B:

Cost/benefit studies in the fishery industry in 1988. The Fisheries Industry, No. 9, 1989.

Bendiksen, B., Dreyer, B:

Cost/benefit studies in the fishery industry in 1987. The Institute of Fishery Technology Research (FTFI), Commissioned Report, 1988.

Dreyer, B:

The difference between strong and weak fishery industry businesses: A relational analysis. Graduate theses at the Institute of Fishery Research (IFF) - Autumn 1985.

Dreyer, B., Løvland, J.:

Cost/benefit studies in the fishery industry in 1986. The Institute of Fishery Technology Research (FTFI), Commissioned Report, 1987.

The Norwegian Raw Fish Association:

Annual Report, 1988, Tromsø, 1989.

The Central Organization of Private Commerce and Industry:

Statistics on wages and absenteeism for 1988.

Olsen, S.O. and Øberg, L:

What characterizes strong and weak fish processing businesses? FTFI/PROFO, Spring 1980.

Olsen, S.O.:

Cost/benefit studies in the shrimp processing industry. Various notes and reports dated FTFI - 1981 - 1987.

Olsen, S.O. and Robertsen, R:

Cost/benefit studies in the shrimp processing industry - the 1988 operating year. FTFI Commissioned Report, 1988.

Central Bureau of Statistics:

Foreign trade 1979 - 1989. Monthly statistics on foreign trade up to August, 1989.

APPENDIX 1

Table V-1 *Statement of income and expenses for 1987 and 1988.*

Group average Number of businesses (N)		N=12 1988		N=12 1987		N=19 1987	
		tonnes	%	tonnes	%	tonnes	%
1.	RAW MATERIAL PURCHASE	3649	100,0	3814	100,0	2806	100,0
1.1	Cod fish	1675	45,9	2259	59,2	1488	53,0
1.2	Other except shrimp	14	0,4	34	0,9	45	1,6
1.3	Shrimp	1959	53,7	1521	39,9	1273	45,4
1.3.1	Whereof for production	1747	47,8	1556	40,8	1335	47,6
		1000 Nkr	%	1000 Nkr	%	1000 Nkr	%
2.	OPERATING INCOME	51870	100,0	64241	100,0	50197	100,0
2.1	From fish production	48802	94,1	60604	94,3	46860	93,4
2.2	From trade activities	2607	5,0	3060	4,8	2905	5,8
2.3	From other activities	461	0,9	577	0,9	432	0,9
3.	SALES INCOME FROM FISH	48802	100,0	60604	100,0	46860	100,0
3.1	Changes in inventory	728	1,5	-1867	-3,1	-1740	-3,7
4.	PRODUCTION VALUE	49530	100,0	58737	100,0	45120	100,0
4.1	Whereof shrimp	28577	57,7	30363	51,7	25088	55,6
5.	DIRECT COSTS	42668	86,1	50548	86,1	39381	87,3
5.1	Raw material, freight - subsidy	34297	69,2	41564	70,8	32795	72,7
5.2	Packaging & add. supplies	1125	2,3	1091	1,9	821	1,8
5.3	Prod. wages incl. social costs	7245	14,6	7893	13,4	5765	12,8
6.	CONTRIBUTION MARGIN, FISH	6862	13,9	8189	13,9	5739	12,7
7.	INDIRECT COSTS	11224	22,7	12511	21,3	9942	22,0
7.1	Fixed salaries incl.social costs	2059	4,2	2190	3,7	1709	3,8
7.2	Sales & administrative expenses	1262	2,5	1088	1,9	799	1,8
7.3	Rent, energy, fuel, water	1518	3,1	1626	2,8	1363	3,0
7.4	Maintenance & repairs	1382	2,8	1407	2,4	1064	2,3
7.5	Sundry indirect costs	644	1,3	1283	2,2	958	2,1
7.6	Interest expenses	2349	4,7	2803	4,8	2443	5,4
7.7	Ordinary depreciation	2010	4,1	2114	3,6	1606	3,6
8.	OPERATING RESULTS (excl. interest)	-4362	-8,8	-4323	-7,4	-4203	-9,3
9.	OTHER REVENUE	4392	8,9	4682	8,0	4160	9,2
10.	OTHER EXPENSES	3039	6,1	3362	5,7	3093	6,9
11.	RESULTS FOR THE YEAR	-3009	-6,1	-3003	-5,1	-3136	-7,0
	+ ordinary depreciation	2010	4,1	2114	3,6	1606	3,6
	- calculated depreciation	3978	8,0	3745	6,4	3000	6,7
12.	ADJUSTED RESULTS	-4977	-10,0	-4634	-7,9	-4530	-10,0

Table V-2 *Regionally distributed statement of income and expenses for 1988.*

Group average		N=8 Finnmark		N=4 Troms	
Number of businesses (N)		tonnes	%	tonnes	%
1.	RAW MATERIAL PURCHASE	3877	100,0	3193	100,0
1.1	Cod fish	2142	55,3	742	23,2
1.2	Other except shrimp	7	0,2	29	,9
1.3	Shrimp	1727	44,6	2422	75,9
1.3.1	Whereof for production	1495	38,6	2243	70,3
		1000 Nkr	%	1000 Nkr	%
2.	OPERATING INCOME	53434	100,0	48741	100,0
2.1	From fish production	49213	92,1	78980	98,4
2.2	From trade activities	3575	6,7	668	1,4
2.3	From other activities	646	1,2	93	0,2
3.	SALES INCOME FROM FISH	49213	100,0	47980	100,0
3.1	Changes in inventory	-48	-0,1	2279	4,7
4.	PRODUCTION VALUE	49165	100,0	50259	100,0
4.1	Whereof shrimp	25333	51,5	41318	82,2
5.	DIRECT COSTS	43223	87,9	41557	82,7
5.1	Raw material, freight - subsidy	34153	69,5	34587	68,8
5.2	Packaging & add. supplies	1110	2,3	1155	2,3
5.3	Prod. wages incl. social costs	7960	16,2	5815	11,6
6.	CONTRIBUTION MARGIN FISH	5942	12,1	8702	17,3
7.	INDIRECT COSTS	12672	25,8	8328	16,6
7.1	Fixed salaries incl. social costs	2510	5,1	1159	2,3
7.2	Sales & administrative expenses	1505	3,1	775	1,5
7.3	Rent, energy, fuel, water	1670	3,4	1214	2,4
7.4	Maintenance & repairs	1459	3,0	1228	2,4
7.5	Sundry indirect costs	586	1,2	761	1,5
7.6	Interest expenses	2575	5,2	1895	3,8
7.7	Ordinary depreciation	2367	4,8	1296	2,6
8.	OPERATING RESULTS (excl. interest)	-6730	-13,7	374	0,7
9.	OTHER REVENUE	5565	11,3	2044	4,1
10.	OTHER EXPENSES	3909	8,0	1298	2,6
11.	RESULTS FOR THE YEAR	-5076	-10,3	1120	2,2
		2367	4,8	1296	2,6
	+ ordinary depreciation	4639	9,4	2654	5,3
	- calculated depreciation	-7348	-14,9	-238	-0,5
12.	ADJUSTED RESULTS				

Table V-3 *Balance sheet for 1987 and 1988.*

Group average Number of businesses (N)		N=12 1988		N=11 1987		N=18 1987	
		1000 Nkr	%	1000 Nkr	%	1000 Nkr	%
1.	CURRENT ASSETS	21291	57,3	20559	48,7	15738	48,8
1.1	Cash, bank, postal giro	2603	7,0	5966	14,1	4183	13,0
1.2	Accounts receivable	8237	22,2	5791	13,7	4622	14,3
1.3	Inventory prod. goods	8265	22,2	5589	13,2	4821	15,0
1.4	Inventory packaging & merch.	321	0,9	1026	2,4	710	2,2
1.5	Other current assets	1866	5,0	2188	5,2	1402	4,3
2.	FIXED ASSETS	15877	42,7	21652	51,3	16501	51,2
2.1	Guarantee fund Norw. R. Fish Ass.	248	0,7	235	0,6	203	0,6
2.2	Stocks, shares, bonds etc.	1499	4,0	2524	6,0	1591	4,9
2.3	Machinery, inventory & equipment	4282	11,5	5936	14,1	4516	14,0
2.4	Transportation equipment	76	0,2	83	0,2	85	0,3
2.5	Buildings	8161	22,0	11030	26,1	8773	27,2
2.6	Housing	1471	4,0	985	2,3	628	1,9
2.7	Other fixed assets	140	0,4	859	2,0	705	2,2
3.	TOTAL ASSETS	37168	100,0	42211	100,0	32239	100,0
4.	SHORT TERM LIABILITIES	20025	54,2	20162	47,8	16730	51,9
4.1	Debts to suppliers	3682	9,9	2916	6,9	2096	6,5
4.2	Bank overdraft	5432	14,6	6004	14,2	6484	20,1
4.3	Taxes, fees, etc. due	2838	7,6	2632	6,2	1937	6,0
4.4	Other short term debts	8073	21,7	8611	20,4	6212	19,3
5.	LONG TERM LIABILITIES	13362	36,0	14717	34,9	11530	35,8
5.1	Mortgage loans	13231	35,6	12909	30,6	10013	31,1
5.2	Other long term debts	131	0,4	1808	4,3	1517	4,7
6.	CONDITIONAL TAX-FREE PROVISIONS	1395	3,8	1662	3,9	1072	3,3
7.	OWNER'S EQUITY	2386	6,4	5670	13,4	2907	9,1
7.1	Restricted owner's equity	1323	3,6	2128	5,2	1660	5,2
7.2	Unrestricted owner's equity	1063	2,9	3542	8,4	1247	3,9
8.	TOTAL LIABILITIES	37168	100,0	42211	100,0	32239	100,0

Table V-4 *Regionally distributed balance sheet for 1988.*

Group average Number of businesses (N)		N=8 Finnmark		N=4 Troms	
		tonnes	%	tonnes	%
1.	CURRENT ASSETS	19774	52,2	24324	68,1
1.1	Cash, bank, postal giro	3125	8,2	1560	4,4
1.2	Accounts receivable	7006	18,5	10699	30,0
1.3	Inventory production goods	7618	20,1	9556	26,8
1.4	Inventory packaging & merch.	390	1,0	184	0,5
1.5	Other current assets	1636	4,3	2324	6,5
2.	FIXED ASSETS	18125	47,8	11380	31,9
2.1	Guarantee fund Norw. R.Fish Ass.	225	0,6	293	0,8
2.2	Stocks, shares, bonds etc.	1590	4,2	1317	3,7
2.3	Machinery, inventory & equipment	4944	13,0	2959	8,3
2.4	Transportation equipment	86	0,2	56	0,2
2.5	Buildings	9067	23,9	6349	17,8
2.6	Housing	2117	5,6	180	0,5
2.7	Other fixed assets	97	0,3	225	0,6
3.	TOTAL ASSETS	37899	100,0	35704	100,0
4.	SHORT TERM LIABILITIES	19516	51,5	21043	58,9
4.1	Debts to suppliers	3855	10,2	3338	9,3
4.2	Bank overdraft	3098	8,1	10100	28,3
4.3	Taxes, fees, etc. due	2998	7,9	2516	7,0
4.4	Other short term debts	9565	25,3	5089	14,3
5.	LONG TERM LIABILITIES	16647	43,9	6791	19,0
5.1	Mortgage loans	16501	43,5	6691	18,7
5.2	Other long term debts	146	0,4	100	0,3
6.	CONDITIONAL TAX-FREE PROVISIONS	1153	3,0	1877	5,2
7.	OWNER´S EQUITY	583	1,5	5992	16,8
7.1	Restricted owner´s equity	1549	4,0	871	2,5
7.2	Unrestricted owner´s equity	-966	-2,5	5122	14,3
8.	TOTAL LIABILITIES	37899	100,0	35704	100,0

Table V-5 *Key figures for 1987 and 1988.*

Group average Number of businesses (N)		N=12 1988	N=12 1987	N=19 1987
1.	PROFITABILITY			
1.1	Results before interest and depreciation	2.72	3.25	2.02
1.2	Results for the year in % of prod. value	-6.07	-5.11	-6.95
1.3	Adjusted results in % of prod. value	-10.05	-7.89	-10.03
1.4	Profit/loss ratio	-1.27	-0.31	-1.38
1.5	Rate of turnover	1.39	1.61	1.64
1.6	Total rate of return	-1.78	-0.50	-2.27
2.	RAW MATERIAL CONDITIONS			
2.1	Processing value per raw material Nkr	0.41	0.38	0.35
2.2	Contribution margin per raw material Nkr	0.20	0.19	0.17
3	PERSONNEL CONDITIONS			
3.1	Proc. value per wage Nkr	1.51	1.59	1.53
3.2	Contribution margin per direct wage Nkr	0.94	1.03	0.99
4	REAL CAPITAL CONDITIONS			
4.1	Prod. value in % of insurance value	89.8	113.6	111.3
4.2	Proc. value in % of insurance value	25.6	31.1	28.4
4.3	Raw material per machine (t)	291.2	259.4	261.5
5.	COST CONDITIONS			
5.1	Direct costs per raw material Nkr	1.24	1.21	1.20
5.2	Indirect costs per raw material Nkr	0.32	0.30	0.30
5.3	Prod. costs per direct wage Nkr	2.54	2.58	2.72
6.	FINANCIAL CONDITIONS			
6.1	Operating capital in % of total capital	3.40	0.72	-3.07
6.2	Liquidity ratio 1	1.06	1.01	0.94
6.3	Liquidity ratio 2	0.63	0.68	0.61
6.4	Owner's equity percentage	10.17	17.19	12.34
6.5	Interest coverage ratio	-28.18	-7.13	-28.37

Table V-6 *Regionally distributed key figures for 1988.*

Group average Number of businesses (N)		N=8 Finnmark	N=4 Troms
1.	PROFITABILITY		
1.1	Results before interest and depreciation	-0,27	8,57
1.2	Results for the year in % of prod. value	-10,32	2,22
1.3	Adjusted results in % of prod. value	-14,94	-0,47
1.4	Profit/loss ratio	-4,68	6,18
1.5	Rate of turnover	1,40	1,36
1.6	Total rate of return	-6,55	8,40
2.	RAW MATERIAL CONDITIONS		
2.1	Processing value per raw material Nkr	0,40	0,42
2.2	Contribution margin per raw material Nkr	0,17	0,25
3	PERSONNEL CONDITIONS		
3.1	Proc. value per wage Nkr	1,32	2,08
3.2	Contribution margin per direct wage Nkr	0,74	1,50
4	REAL CAPITAL CONDITIONS		
4.1	Prod. value in % of insurance value	74,97	146,75
4.2	Proc. value in % of insurance value	21,20	42,38
4.3	Raw material per machine (t)	235,14	427,17
5.	COST CONDITIONS		
5.1	Direct costs per raw material Nkr	1,26	1,20
5.2	Indirect costs per raw material Nkr	0,37	0,24
5.3	Prod. costs per direct wage Nkr	2,59	2,43
6.	FINANCIAL CONDITIONS		
6.1	Operating capital in % of total capital	0,67	9,18
6.2	Liquidity ratio 1	1,01	1,15
6.3	Liquidity ratio 2	0,60	0,69
6.4	Owner´s equity percentage	4,58	22,04
6.5	Interest coverage ratio	-97,12	159,10

Table V-7 *Regionally distributed contribution margin statement for 1988.*

Group average Number of businesses (N)		N=18 Finnmark		N=4 Troms	
		1000 Nkr	%	1000 Nkr	%
1.	SALES INCOME	23570	100,0	40565	100,0
1.1	Sales income reductions	1156	4,9	1647	4,1
1.2	Changes in inventory	1703	7,2	862	2,1
2.	PRODUCTION VALUE (fob)	24117	100,0	39780	100,0
3.	DIRECT VARIABLE COSTS	22340	92,6	32764	82,3
3.1	Raw material - subsidies, ice	19137	79,4	27317	68,7
3.2	Prod. wages, incl. social costs	2829	11,7	4552	11,4
3.3	Packaging & add. supplies	374	1,5	895	2,2
4.	CONTRIBUTION MARGIN I	1777	7,4	7016	17,6
5.	RATIOS				
5.1	CM/Raw material kg, Nkr/kg	1,18		3,12	
5.2	CM/Product kilo, Nkr/kg	3,93		9,55	
5.3	CM/Prod. kilo excl. glazing, Nkr/kg	4,34		10,65	
6.	CALCULATED DATA BASED ON				
6.1	Number of machines	51		21	
6.2	Sales weight incl. glazing (t)	412		708	
6.3	Raw material f. clean. incl. waste(t)	1499		2243	
6.4	Product weight incl. glazing (t)	452		734	
6.5	Cleaning yield incl. glazing	30,2		32,7	
6.6	Degree of glazing	9,5		10,3	
6.7	Inventory value of finished goods Dec 31, Nkr/kg	44,92		45,84	

APPENDIX 2

DEFINITIONS AND CALCULATION METHODS

For the data gathering we used official company statements (financial statements), statements of operating income and expenses, annual reports and statistics. With respect to a business' total operating results, balance sheets and key figures, we used the same definitions and methods of calculation as in the Cost/benefit Studies. The only difference is that we did not calculate any results based on calculated depreciation.

2.1 Explanation and definitions for Table V-1: Statement of income and expenses for 1987 and 1988.

1. Raw material purchase

1.1 includes the purchase of cod fish in whole tonnes, gutted, head removed, weight. Other raw material for production, apart from shrimp, may consist of bi-products, salmon, capelin, octopus, etc. Total purchases of shrimp for all uses are listed under item 1.3. The portion of the purchase that goes to cleaning during the operating year has been separated (1.3.1).

2. Operating income

Includes the sales value of goods and services sold during the period. Freight, special government fees, bonuses and transfers are included. Returns, claims, rebates, sales provisions, freight

expenses and the like have been deducted. Sales are listed as f.o.b. and do not include fees for value added tax.

"Whereof for fish production" refers to income from internal production. Income from fish products that are purchased from private producers and are intended for resale, is considered as trade activities and is listed under item 2.2. Purchase of cleaned shrimp from other producers is one example of the latter.

"Income from other activities" includes income from, e.g., post, shipping, leasing activities, boats, aquaculture, line bait facilities and similar activities carried out by the same company as the fishery activities.

"Changes in inventory" (3.1) are evaluated f.o.b. for finished fish products.

4. Production value

Also includes net sales income from fish goods from internal production + any changes in inventories. The production value of shrimp (4.1) also includes shrimp sold with the shell for consumption or to other producers. The amount is evaluated f.o.b. and transport subsidies and the like are included.

5. Direct costs

Costs for raw material (5.1) are calculated after deduction of returns, rebates, quality reductions, price subsidies and other subsidies. We have also made adjustments for inventories of fish raw material. Freight, ice and other expenses related to the purchase of fish are included.

Production wages (5.3) include book wages and social costs for workers and foremen in direct production work.

7. Indirect costs

These are costs that are very little affected by the activity level of the business. Indirect and fixed salaries and social costs for commercial and technical employees. Book salaries, as well as calculated salaries, for managers and a working owner are included under this item.

Sales and administrative costs (7.2) include costs such as publicity, representation, contingencies, office equipment, telephone, postage, purchase of administrative services and travel expenses. Unspecified losses involving accounts receivable and commission expenses may be included under this item.

Sundry indirect costs (7.5) include costs for company owned transportation equipment, insurance premiums and other operating expenses.

Interest (7.6) includes the book value of interest on mortgage loans and bank overdrafts.
Ordinary depreciation (7.7) must not include extraordinary depreciation.

9. Other income

This is the total operating income from trade activities and other activities. Financial income and extraordinary income are also included.

10. Other costs

These are costs related to income listed under item 9. Essential costs are direct product costs for merchandise and fish intended for resale. Also included are salaries and social costs related to trade and other activities, extraordinary expenses, etc.

Calculated depreciation is estimated on the basis of the replacement value (fire insurance value). We here used a period of depreciation of eight years for machines, fittings and fixtures, and 25 years for buildings.

2.2 Explanation and definitions for Table V-3: Balance sheet for 1987 and 1988.

1. Current assets

Inventories were evaluated according to current accounting principles. Sales value was reduced by sales expenses, and there was also a certain reduction for the risk of a drop in prices. At the time inventory was taken, a certain hidden reserve may have been set aside. Inventory of production goods (1.3) includes inventory of fish products, including semi-processed goods and fish raw material.

Other current assets (1.5) include, e.g., shares, bonds, bills of exchange and other short term receivables.

3. Short term liabilities

Short term liabilities are debts that come due, or can be redeemed within a year. Bank overdraft (3.2) includes construction loans.

6. Owner´s equity

Investment subsidies are included under unrestricted owner´s equity (6.3).

2.3 Definitions of key figures in Table V-5.

Numbers within brackets refer to Table V-1 and Table V-2.

1.1	Results before interest & depreciation	=	(Annual results (11) + interest (7.6) + ordinary depreciation (7.7)) x 100 / Production value (4)
1.2	Annual results	=	Annual results (11) x 100 / Production value (4)
1.3	Adjusted results	=	Adjusted results (12) x 100 / Production value (4)
1.4	Result ratio	=	(Annual results (11) + interest (7.6)) x 100 / Operating income (2)
1.5	Rate of turnover	=	Operating income (2) / Total assets as of Dec. 31
1.6	Total rate of return	=	(Annual results (11) + interest (7.6)) x 100 / Total assets as of Dec. 31
2.1	Processing value per raw material Nkr	=	Prod. value (4) - Material costs (5.1 and 5.2) / Raw material costs (5.1)
2.2	Contribution margin per raw material Nkr	=	Contribution margin (6) / Raw material costs (5.1)
3.1	Processing value per wage Nkr	=	Processing value / Total wage costs (5.3 + 7.1)
3.2	Contribution margin per direct wage Nkr	=	Contribution margin (6) / Production wages (5.3)
4.1	Prod.value in percent of insurance value	=	Production value (4) x 100 / Fire insurance value of buildings, machines, fittings, etc. in fishing activities
4.2	Processing value in % of insurance value	=	Processing value x 100 / Fire insurance value
4.3	Raw material per machine	=	Total annual production of shrimp raw material / Total number of cleaning machines
5.1	Direct costs per raw material Nkr	=	Direct costs (5) / Raw material costs (5.1)
5.2	Indirect costs per raw material Nkr	=	Indirect costs (7) / Raw material costs (5.1)

5.3	Production costs per direct wage Nkr	=	Prod. costs (7 + 5.3) / Prod. wages (5.3)
6.1	Working capital in percent of tot. cap.	=	(Current assets - short term liabilities x 100 / Total capital as of Dec. 31
6.2	Liquidity ratio 1	=	Current assets as of Dec. 31 / Short term liabilities as of Dec.31
6.3	Liquidity ratio 2	=	Current assets - inventory as of Dec.31 / Short term liabilities as of Dec. 31
6.4	Owner´s equity share	=	(Owner´s eq.+ cond. tax prov. as of Dec.31 x 100 / Total capital as of Dec. 31
6.5	Interest coverage ratio	=	Annual results (11) + interest costs (7.6) x 100 / Interest costs (7.6)

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[5] Transl. note: Presumably DH = District College